

The substances employed included ammonium phosphate, Bridgmann's black phosphorus, phosphoric acid, and commercial red phosphorus. It was found that the wave-lengths of the limits of absorption were different for the various kinds of phosphorus. This is the first time that the chemical state of an element has been found to have an influence on its X-ray spectrum.—**M. de Broglie** and **A. Dauvillier**: The fine structure of the absorption discontinuities in X-ray spectra. A discussion of some phenomena having a bearing on the results described in the preceding paper by **M. Bergengren**.—**A. Dauvillier**: The mechanism of the chemical reactions caused by the X-rays. The only mineral substances sensible to the action of the X-rays are crystals for which **I. Langmuir**, **Born and Landé**, and **Debye and Sherrer** have supposed and proved the existence of an ionic structure. All other sensitive substances, colloids, electrolytes, glass, etc., also contain ions. The cause of the chemical actions would thus be due to the destruction of the negative ions, which would lose their electrons under the impact of the rapid electrons constituting the corpuscular radiation. The violet coloration of alkaline glasses, the photo-electric properties of crystals, and the colour-changes in platinumcyanide screens are considered from this point of view.—**H. Copaux** and **C. Philips**: The heat of oxidation of beryllium. Direct combustion of the metal in compressed oxygen in the calorimetric bomb gave unsatisfactory results; the combustion of the metal was never complete. The figure required was hence derived indirectly by measuring the heats of solution of the metal and its oxide in dilute hydrofluoric acid. The heat of oxidation, 151.5 calories, was high, and ranges beryllium with calcium (160 calories), lanthanum (148 calories), and magnesium (144 calories).—**G. Denigès**: The microchemical reactions of radium: its differentiation from barium by iodic acid. The usual reagents employed in the microchemical reactions of barium, hydrofluosilicic, oxalic, and tartaric acids, tartar emetic, potassium ferrocyanide, and tartrate give identical results with barium and radium salts. Ammonium cyanurate, ammonium phosphomolybdate in ammonia solution, and potassium bromate, which are also good reagents for barium, give similar crystals with radium compounds. Iodic acid, on the other hand, shows clear differences between the two metals, and reproductions of two microscope-slides are given to prove this. As showing the delicacy of the microchemical method, it is mentioned that all experiments on the reactions of radium were carried out with 0.2 milligram of metallic radium added as the bromide.—**R. Fosse**: The qualitative analysis of cyanic acid.—**A. Lumière** and **F. Perrin**: A new class of hypnotics: the dialkylhomophthalimides. Starting with naphthalene, this is oxidised to phthalonic acid, which reduced by hydriodic acid leads to homophthalic acid, $(\text{CO.OH}).\text{C.H.}.\text{CH}_2.\text{CO.OH}$, the ammonium salt of which, evaporated to dryness and gently fused, gives the homophthalimide. From this dialkyl derivatives are readily obtained. Used as hypnotics, they possess the advantages of very slight toxic power, and are practically free from unfavourable secondary reactions.—**F. Kerforne**: The tectonic of the Armorican massif.

Books Received.

Die Einsteinsche Relativitätstheorie. By Prof. U. Kopff. Pp. 24. (Leipzig: Greszner und Schramm.) 1.25 marks.

"A New Activity?" A Treatise on Mrs. Dickinson's Discovery of a "New Radio-Activity." By Frank A. Hotblack. Pp. ix+195+plates. (London: Jarrolds, Ltd.) 10s. 6d. net.

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Studies in Fossil Botany. By Dr. D. H. Scott. Third edition. Vol. i., Pteridophyta. Pp. xxiii+434. (London: A. and C. Black, Ltd.) 25s. net.

Slide-Rules and How to Use Them. By T. Jackson. Pp. 30. (London: Chapman and Hall, Ltd.) 1s. 6d. net.

Magic in Names and in Other Things. By E. Clodd. Pp. vii+238. (London: Chapman and Hall, Ltd.) 12s. 6d. net.

Œuvres complètes de Christiaan Huygens. Tome Quatorzième. Calcul des Probabilités. Travaux de Mathématiques Pures, 1655-1666. Pp. v+557. (La Haye: M. Nijhoff.)

Practical River and Canal Engineering. By R. C. R. Minikin. Pp. vii+123+xii plates. (London: C. Griffin and Co., Ltd.) 12s. 6d.

Animal Life in South Africa. By S. H. Skaife. Pp. x+281. (Cape Town: T. Maskew Miller; Oxford: B. Blackwell.) 15s. net.

Mechanismus und Physiologie der Geschlechtsbestimmung. By Prof. R. Goldschmidt. Pp. viii+251. (Berlin: Gebrüder Borntraeger.) 32 marks.

Fifteenth Annual Report of the Meteorological Committee to the Lords Commissioners of His Majesty's Treasury for the Year ended March 31, 1920. (Cmd. 948.) Pp. 88. (London: H.M. Stationery Office.) 9d. net.

Electric Switch and Controlling Gear. By Dr. C. C. Garrard. Second edition. Pp. xxii+654. (London: Benn Bros., Ltd.) 25s. net.

Landscape Architecture. By Prof. H. V. Hubbard and T. Kimball. Pp. 132. (Cambridge, Mass.: Harvard University Press; London: Oxford University Press.) 6s. 6d. net.

The Elder Edda and Ancient Scandinavian Drama. By Dr. B. S. Phillpotts. Pp. xi+216. (Cambridge: At the University Press.) 21s. net.

Hittite Seals. By D. G. Hogarth. Pp. xi+108+10 plates. (Oxford: Clarendon Press.) 3l. 13s. 6d. net.

The Flowering Plants of South Africa. Edited by Dr. I. B. Pole Evans. Vol. i., No. 1. (London: L. Reeve and Co., Ltd.) 10s.; hand-coloured plates, 15s.

Relativitätstheorie und Erkenntnis Apriori. By H. Reichenbach. Pp. v+110. (Berlin: J. Springer.) 14 marks.

The Second Danish Pamir Expedition. Conducted by Lt. O. Olufsen. Studies in the Vegetation of Pamir. By O. Paulsen. Pp. ix+132. (Copenhagen: Gyldendalske Boghandel.)

Psychologie du Raisonnement. By E. Rignano. Pp. xi+544. (Paris: F. Alcan.) 18 francs.

The Sun a Habitable Body like the Earth. A Book on Solar Physics. By Sree B. Raha Dass. Pp. xiv+130. (Calcutta: Thacker, Spink and Co.)

Medical Research Council and Department of Scientific and Industrial Research. Reports of the Industrial Fatigue Board. No. a. A Study of Output in Silk Weaving during the Winter Months. (Textile Series, No. 3.) Pp. 69. (London: H.M. Stationery Office.) 2s. 6d. net.

The Civil Servant and his Profession. A Series of Lectures delivered to the Society of Civil Servants in March, 1920. Pp. viii+124. (London: Sir I. Pitman and Sons, Ltd.) 3s. 6d. net.

The Determination of Hydrogen Ions. By Dr. W. M. Clark. Pp. 317. (Baltimore, Md.: Williams and Wilkins Co.) 5.50 dollars.

The Groundwork of Modern Geography. By Dr. A. Wilmore. Pp. xv+396+xxvii plates. (London: G. Bell and Sons, Ltd.) 6s. net.

A First Course in the Calculus. By Prof. W. P. Milne and G. J. B. Westcott. Part ii.: Trigonometric

and Logarithmic Functions of X , etc. With Answers. Pp. xv+181-402+xv-xxxix. (London: G. Bell and Sons, Ltd.) 5s.

Plantation Rubber and the Testing of Rubber. By Dr. G. S. Whitby. Pp. xvi+559+viii plates. (London: Longmans, Green and Co.) 28s. net.

The Centenary Volume of Charles Griffin and Company, Ltd., Publishers, 1820-1920. With Foreword by Lord Moulton. Pp. xx+290+plates. (London: C. Griffin and Co., Ltd.)

Diary of Societies.

THURSDAY, OCTOBER 28.

CHEMICAL SOCIETY (at Institution of Mechanical Engineers), at 8.—Dr. M. O. Forster: The Emil Fischer Memorial Lecture.

ABERNETHIAN SOCIETY (at St. Bartholomew's Hospital), at 8.30.—Sir St. Clair Thomson: Recollections of Joseph Lister by one of his House-surgeons.

ROYAL SOCIETY OF MEDICINE (Urology Section), at 8.30.—Sir Thomas Horder: The Treatment of Sub-acute Nephritis by Decapsulation; with an Account of Four Cases.—V. Bonney: A New Operation for Nephroptosis.

FRIDAY, OCTOBER 29.

ROYAL GEOGRAPHICAL SOCIETY (at the Eolian Hall), at 5.—T. A. Barnes: In the Land of the Okapi and the Gorilla.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, at 5.—Prof. A. Keith: Demonstration on the Contents of the Museum.

INSTITUTION OF MECHANICAL ENGINEERS (Informal Meeting), at 7.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.—H. W. Bennett: Winchester: The Cathedral, the School, and the Hospital of St. Cross.

CHEMICAL INDUSTRY CLUB (at 2 Whitehall Court), at 8.—Annual Meeting.

ROYAL SOCIETY OF MEDICINE (Epidemiology and State Medicine Section), at 8.30.—Dr. A. K. Chalmers: The Function of the Isolation Hospital in a General Scheme of Hospital Provision.

MONDAY, NOVEMBER 1.

ROYAL INSTITUTION OF GREAT BRITAIN, at 5.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, at 5.—Prof. S. G. Slatkock: Demonstration of Pathological Specimens in the Museum.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.

INSTITUTE OF BREWING (at Imperial Hotel, Russell Square), at 8.—A. F. Baillie: The Use of Oil Fuel in Breweries.

SOCIETY OF CHEMICAL INDUSTRY (at Institution of Mechanical Engineers), at 8.—Sir William J. Pope: The Photography of Coloured and of Distant Objects.

TUESDAY, NOVEMBER 2.

ROYAL HORTICULTURAL SOCIETY, at 3.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, at 5.—Sir William B. Leishman: An Experimental Investigation of the Parasite of Tick Fever, *Spirochaeta Duttoni* (Horace Dobell Lecture).

INSTITUTION OF CIVIL ENGINEERS, at 5.30.—J. A. Brodie: Presidential Address.

ZOOLOGICAL SOCIETY OF LONDON, at 5.30.—J. H. Lloyd: Some Observations on the Structure and Life-history of the Common Nematode of the Dogfish (*Scyllium canicula*).—Mrs. O. A. Merritt Hawkes: Observations on the Life-history, Biology, and Genetics of the Lady-bird Beetle, *Adalia bipunctata*, Mulsant.—Harn Ram Mehra: The Sexual Phase in certain Indian Naididae (Oligochaeta).—E. A. Barnes: In the Land of the Gorilla and Okapi.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.—Capt. C. W. R. Knight: Herodry.

RÖNTGEN SOCIETY, at 8.15.

WEDNESDAY, NOVEMBER 3.

GEOLOGICAL SOCIETY OF LONDON, at 5.30.—Miss M. E. J. Chandler: The Arctic Flora of the Cam Valley at Barnwell, Cambridge.

SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS (at Chemical Society), at 8.—Dr. W. R. Schoeller and E. F. Waterhouse: The Gravimetric Estimation of Bismuth as Phosphate and its applications in Ore Analysis.—P. J. Fryer: The Time Factor in Saponification.—V. Cofman: The Position of Analytical Chemistry in France.—W. T. Burgess: Apparatus for collecting Samples of Water at Great Depths.

THURSDAY, NOVEMBER 4.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Prof. H. Lamb: The Vibrations of an Elastic Plate in Contact with Water.—Prof. H. M. Macdonald: The Transmission of Electric Waves around the Earth's Surface.—Lord Rayleigh: A Re-examination of the Light scattered by Gases in respect of Polarisation. II. Experiments on Helium and Argon.—Prof. C. F. Jenkin: Dilatation and Compressibility of Liquid Carbonic Acid.—W. T. David: Radiation in Explosions of Hydrogen and Air.—Dr. R. E. Slade and G. I. Higson: Photochemical Investigations of the Photographic Plate.—Dr. E. H. Chapman: The Relationship between Pressure and Temperature at the same Level in the Free Atmosphere.—Prof. J. C. McLennan: Note on Vacuum Grating Spectroscopy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, at 5.—Dr. R. C. B. Wall: Chorea (Bradshaw Lecture).

LINNEAN SOCIETY, at 5.

ROYAL AERONAUTICAL SOCIETY (at Royal Society of Arts), at 5.30.—Wing-Comdr. Flack: The Human Machine in Relation to Flying.

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CHILD-STUDY SOCIETY (at Royal Sanitary Institute), at 6.—Mrs. S. S. Brierley: Discussion on Vocational Tests.

CHEMICAL SOCIETY, at 8.—L. Higginbotham and H. Stephen: The Preparation of 4-, 5-, and 6-Methyl-coumarin-2-ones, and some Derivatives of *o*-, *m*-, and *p*-Tolylxyacetic Acids.—H. Stephen: A New Method for the Preparation of 2:4-Dihydroxy- and 2:4:4'-Trihydroxy-benzophenone, and some Observations relating to the Hoesch Reaction.—W. J. Pope and E. E. Turner: Triphenylarsine and Diphenylarsenous Salts.—R. H. Atkinson, C. T. Heycock, and W. J. Pope: The Preparation and Physical Properties of Carbonyl Chloride.—H. W. Bausor, C. S. Gibson, and W. J. Pope: Interaction of Ethylene and Selenium Monochloride.—G. Van B. Gilmour: A Study of the Reactions of Sugars and Polyatomic Alcohols in Boric Acid and Borate Solutions, with Some Analytical Applications.—F. L. Pyman and L. A. Ravald: The Sulphonation of Glyoxalines.—F. L. Pyman and L. A. Ravald: *o*- and *p*-Toluenesulfonyloxalines.—M. E. Laing and J. W. McBain: Investigation of Sodium Oleate Solutions in the Three Physical States of Curd, Gel, and Sol.—J. C. Irvine and E. S. Steele: The Constitution of Polysaccharides. Part I. The Relationship of Inulin to Fructose.—B. E. Hunt: The Preparation of Ethyl Iodide.—G. C. Menzies: Action of Sulphur Trioxide on Aromatic Ethers.—G. T. Morgan and H. D. K. Drew: Researches on Residual Affinity and Coordination. Part II. Acetylacetones of Selenium and Tellurium.—R. B. Drew: The Formation of 2:3:6-Trinitrotoluene in the Nitration of Toluene.—J. N. E. Day and J. F. Thorpe: The Formation and Reactions of Imino-compounds. Part XX. The Condensation of Aldehydes with Cyanoacetamide.—O. Becker and J. F. Thorpe: The Formation and Stability of Spiro-compounds. Part III. Spiro-compounds from Cyclopentane.—H. Chattopadhyaya and P. C. Ghosh: Condensation of Dimethyldihydroresorcin with Aromatic Aldehydes.—E. B. Maxted: The Influence of Lead on the Catalytic Activity of Platinum.

FRIDAY, NOVEMBER 5.

ASSOCIATION OF ECONOMIC BIOLOGISTS (in Botanical Lecture Theatre, Imperial College of Science), at 2.30.—Prof. F. W. Oliver: The Reclamation of Waste Land by Botanical Means.—Dr. E. J. Russell: The Reclamation of Waste Land by Agricultural Means. GEOGRAPHICAL COMMITTEE (Royal Astronomical Society), at 5.—Discussion on the African Arc and Meridian, to be opened by Col. H. G. Lyons, and continued by Sir Charles Close, Col. E. M. Jack, A. R. Hinks, C. G. T. McCaw, and others. INSTITUTION OF MECHANICAL ENGINEERS, at 6.—Sir Richard T. Glarebrook: Limit Gauging (Thomas Hawksley Lecture).

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